

## Middle-Grades Teaching Practices: A Validation Study

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## Abstract

This paper presents the results of a validation study to determine the reliability and validity of psychometric instruments developed to measure middle-grade teachers (fifth through eighth grade) levels of engagement in interdisciplinary team practices and classroom instructional practices. Data were collected using self-study survey measures for middle-grades teachers from more than 6,200 teachers in a diverse sample of 235 middle-grade schools in Arkansas, Louisiana, Michigan, and Mississippi in 2003. Exploratory and confirmatory factor analyses and reliability analyses were conducted to examine the psychometric properties of two scales: interdisciplinary team practices and classroom instructional practices. Lower-order and higher-order factors were identified for both the interdisciplinary team and classroom practices. The results demonstrate the validity of the measures used in this study and provide a foundation for subsequent exploration and research of this model for school improvement.

For decades, advocates for middle-grades education have posited the importance of implementing a middle-grades concept to bring about the necessary reform of middle-grade schools to better meet the educational and developmental needs of young adolescents. The middle-grades concept can be defined as a vision for middle-grades education that guides the educational experiences of young adolescents and typically incorporates practices such as interdisciplinary teaming, advisory programs, exploratories, integrated curriculum, hands-on learning, and cooperative learning. In fact, position papers from national organizations and other scholarly publications have recommended such key components to ensure the academic, social, and emotional success of students attending middle-grade schools (Jackson & Davis, 2000; National Forum to Accelerate Middle Grades Reform, 1994-2003; National Middle School Association, 2003).

Central to the middle-grades concept are the instructional planning undertaken by interdisciplinary teams of teachers and the unique classroom instructional practices that focus on academic content delivered in the most appropriate and effective ways for young adolescent learners. Instructional planning by interdisciplinary teams generally focuses on creating coordinated lesson plans; sharing and discussing student progress, problems, and issues; and integrating subjects around a central theme or issue (Epstein & Mac Iver, 1990; Erb, 2001; George & Alexander, 2003; Pate, 1997). Instructional practices or strategies include what teachers do (e.g., lecture, lead discussions), the type of work assigned, the focus of the work, and what students do (e.g., work individually, work in groups, use manipulatives), what is expected of students, and how it is evaluated (Burstein, McDonnell, Van Winkle, Ormseth, Mirocha, & Guiton, 1995). These two central concepts are highly related since what occurs during the coordination and planning of instruction is ultimately implemented in the classroom. Studies

conducted by Backes, Ralston, and Ingwalson (1999), Felner, Jackson, Kasak, Mulhall, Brand, and Flowers (1997), Flowers, Mertens, and Mulhall (2000), Lee and Smith (1993), Mac Iver and Epstein (1991), Mertens and Flowers (2003), and Mertens, Flowers, and Mulhall (2002) have, to a degree, addressed how these components are related to one another and the impact that restructuring has on the relationships between these components and outcomes such as student achievement.

The task of measuring instruction is challenging because both large-scale portraits and close up detailed information are needed to understand teaching (Ball & Rowan, 2004). Researchers have gathered data on teaching instruction in a variety of ways over the years, including surveys of teachers, teacher logs, interviews with teachers, artifact reviews, and classroom observations. Most of what we currently know about instructional practices comes from in-depth studies done in a handful of classrooms whose generalizability to other classrooms is not known (Mayer, 1999). Large-scale research on instruction is very limited. Smithson and Porter (1994) and Burstein et al. (1995) have completed the only systematic investigations of the accuracy of using surveys to measure various aspects of the curriculum, including instruction (Mayer, 1999).

Teacher surveys are the most cost effective way to collect systematic data on instruction from a large number of classrooms and schools in a relatively short time frame. While teacher survey data alone cannot capture the information necessary to thoroughly assess instruction (and ultimately its impact on student outcomes), it is a critically important research component. Without good measures of instruction in educational research, no amount of statistical sophistication will lead to valid inferences about instructional effects on student achievement (Rowan, Correnti, & Miller, 2002). A review of the literature on large-scale survey research on

teaching found that many studies use inexact measures with questionable reliability and validity (Ball & Rowan, 2004), and that research assessing the validity and reliability of self-reported teacher data is limited (Mayer, 1999). What we do know is that future efforts to link instructional strategies and student outcomes should move away from separate analyses of single items and focus on instructional groups or repertoires by using composite scores (Burstein et al., 1995; Mayer, 1999).

This paper will present the results of a validation study to determine the reliability and validity of psychometric instruments developed to measure middle-grade teachers' (fifth through eighth grade) levels of engagement in interdisciplinary team practices and classroom instructional practices. This validation study examines one part of a larger structural equation model designed to measure the impact and effect of various components of middle-school restructuring (i.e., structures and organization, school contextual factors, teaching practices, and student outcomes, including experiences, socio-emotional, and achievement). The results will demonstrate the validity of the measures used in this study and provide a foundation for subsequent exploration and research of this model for school improvement.

### Objectives

The development and validation of instruments designed to measure levels of interdisciplinary team and classroom instructional practices in middle-grade schools are critical to how these practices are influenced by school organizations and structures and how they predict student outcomes including student achievement. The specific objectives of this study were the following:

- To describe the development of a set of measures designed to assess levels of team and classroom practices
- To assess the psychometric properties of the instruments
- To evaluate whether a higher-order structure is present and appropriate for assessing levels of teaching/learning practices

## Methods

### *Data Sources*

The data for this study were collected using the School Improvement Self-Study, a set of quantitative survey measures for middle-grades teachers, students, administrators, and parents. In 2003, more than 6,200 teachers in 235 middle-grade schools in Arkansas, Louisiana, Michigan, and Mississippi participated in the Self-Study. These schools are located in diverse geographic areas (i.e., urban, rural, suburban), contain students in grades five through eight, and have an average of 55 percent of the student population receiving free or reduced-price lunch. With such a large sample of teachers, we were able to split the data into two sub-samples by randomly assigning schools to either a development group (50%) or a testing group (50%) for analysis purposes. This methodology allows us to cross-validate our findings from the development sample with the data in the testing sample. We will not, however, report cross-validation results in this paper due to the need to restrict the use of the testing sample as part of the broader structural equation model.

Using the development sub-sample of over 3,000 teachers in 113 schools, it was necessary to consider other factors that influence team and classroom instructional practices. In addition to traditional middle-grade configurations (i.e., 5-8, 6-8, 7-8), the schools in our overall

four-state sample have several different types of elementary and high school grade configurations including K-8, K-12, 7-12. In prior analyses, we have observed that levels of teacher practices vary from elementary to middle to high school; therefore, it was necessary to select only schools with middle-grade configurations (e.g., 5-8, 6-8, 7-8). We have also observed that teacher reports of the levels of these practices vary depending on type of class—core, academic (e.g., language arts, mathematics, science, social studies) or non-core (e.g., art, music, technology). By selecting out only core, academic teachers in middle-grade schools, our sub-sample for this analysis was 1,493 teachers in 96 schools.

### *Measures*

In 1990-91, the Center for Prevention Research and Development (CPRD) at the University of Illinois, Urbana-Champaign, developed a School Improvement Self-Study process for middle-grade schools. The Self-Study consisted of quantitative survey measures for teachers, students, and principals. The constructs and indicators were based on the recommendations of the Carnegie Corporation's seminal work, *Turning Points: Preparing American Youth for the 21<sup>st</sup> Century* (Carnegie Council on Adolescent Development, 1989). *Turning Points* contained a set of recommendations to improve middle grade schools, particularly schools containing large percentages of at-risk students. These recommendations included creating small, safe, personalized learning communities, teacher advocates for every student, relevant curriculum and appropriate instructional strategies, teachers prepared to teach this age group, and family and community involvement. Utilizing these recommendations and the extant research literature on middle schools and young adolescent developmental needs, CPRD developed the Self-Study as a

set of quantitative measures to assist schools in measuring the level of implementation of the *Turning Points* recommendations.

This study will focus on the measurement of teacher reports of interdisciplinary team practices and classroom instructional practices. The Self-Study teacher survey measures these two areas with a series of items derived from practitioners and researchers as effective strategies for improving student success. Interdisciplinary team practices include activities such as planning and coordination of team activities, curriculum integration, coordination of student assignments, parent contact, and involvement of other school resource staff (e.g., technology, arts). Teachers responding to the 27 team practices questions answer using a seven-point frequency metric ranging from never (1) to daily (7).

The team practices questions are designed to be answered by middle-grades teachers that are engaged in interdisciplinary teaming in their school. Interdisciplinary teaming is broadly defined as a group of teachers that coordinate the teaching of core subject areas (e.g., English, mathematics, science, social studies) within the same group of students over the course of the school year. Teachers engaged in teaming typically have common planning periods, in addition to their individual planning periods, to facilitate the coordination of team practices and activities. Teaming enables middle-grade schools with large student populations to create smaller, more personalized learning communities.

The classroom practices questions are designed to measure how frequently teachers are engaged in different types of practices or strategies within their classrooms. These practices include small group instruction, critical thinking practices, authentic instruction and assessment, literacy and mathematical skill practices, computer usage, community-based learning, citizenship and social responsibility, and heterogeneous ability grouping practices. Similar to team

practices, teachers responding to the 56 classroom practices questions answer using a seven-point frequency metric ranging from never (1) to daily (7). Only the responses of core academic teachers (i.e., language arts, math, science, and social studies) are included in this analysis of team and classroom practices.

### *Data Analysis*

This study is part of a broader structural equation model for middle-school restructuring that asserts that multiple educational reform factors (e.g., teaming structure, quality of team interactions, school contextual factors, team practices, classroom practices), in combination with each other, impact student success (i.e., socio-emotional development, student achievement). The large scale of the data collected for the broader project, of which this study is a small piece, allowed us to bifurcate the data, randomly assigning cases either to a model development sub-sample or to a model testing sub-sample using a stratified approach to ensure that data from each grade, school, and state were represented in both sub-samples. By splitting the original data, we can utilize the model development sub-sample to investigate, modify, and refine hypothesized models (or even generate new models), with no limitations to model modification, because the model testing sample provided the opportunity to examine the cross-validation of these models in a separate, uncontaminated sample. To be most useful in cross-validation, however, we have restricted our use of the model testing sample; thus, we do not report cross-validation evidence at this juncture. We plan to cross-validate this study in the model-testing sample as part of our work on the broader structural equation model.

The initial method of data analysis used exploratory factor analysis (EFA) to identify potential factors. Next, the internal consistency form of reliability was evaluated using

Cronbach's  $\alpha$ . The primary mode of data analysis, however, used confirmatory factor analysis (CFA) and higher-order CFA to investigate the factor structure of survey items measuring interdisciplinary team practices (planning and coordination, curriculum integration, coordination of assignments and assessments, parent contact, and contact with other school resource staff) and classroom practices (small group critical thinking skills, interdisciplinary integration, authentic instruction and assessment, literacy skills, mathematical skills, computer usage, community-based learning, citizenship and social responsibility, and heterogeneous ability grouping). We only considered CFA models that we were confident were identified models (Bollen, 1989); thus, each model had at least three indicators per factor; each item had a factor complexity of one; and measurement error terms were not correlated.

## Results

### *Interdisciplinary Team Practices*

#### *Exploratory Factor Analysis*

We started our analysis with exploratory factor analysis (EFA) of the 27 team practices items, with the scree plot suggesting two factors. Two factors were extracted using principle axis factoring and rotated using direct oblimin rotation with Kaiser normalization to allow for correlated factors. These two factors accounted for 44.8 percent of the variance. Examination of the pattern matrix (Table 1) suggested that the first factor represented general team practices (17 items,  $\alpha = .926$ ), and the second factor represented the involvement of students, parents, and other staff involved with the team (10 items,  $\alpha = .864$ ).

*Confirmatory Factor Analysis*

We initially fit a one factor model for the 27 team practices items with 1,194 teachers, which exhibited marginally acceptable fit as measured by the non-normed fit index (NNFI) of .93, the comparative fit index (CFI) of .94, the root-mean-square-error-of-approximation (RMSEA) of .12, and the standardized root-mean-residual (standardized RMR) of .072. The observed  $\chi^2$  (324, N=1,194) was 4,219 (yielding a  $\chi^2$  to df ratio of 13.0); and although this value and its ratio to the df could only be described as abysmal, the  $\chi^2$  fit statistic is widely acknowledged to be highly susceptible to the influence of sample size, which is quite large for this study. Although several of these fit statistics are generally acceptable (Bentler, 1990; Bentler & Chou, 1987; Bollen, 1989; Hu & Bentler, 1999), utilizing a multifaceted profile approach to fit, as suggested by Tanaka (1993), would suggest rejecting this model.

Next, we fit a two factor model to the team practices items. The EFA we reported earlier was used to develop a two factor model in which the student, parent, and other staff involvement items were used as indicators of a second factor, in addition to the more general factor. While this model did demonstrate incremental improvements in fit (NNFI = .96; CFI = .96; RMSEA = .089; standardized RMR = .067; and  $\chi^2$  [323, N=1,194] = 2,949), there is still room for improvement, especially in the RMSEA.

Lastly, we fit a model in which we postulated a five factor model based on the item specification used to develop the team practice items: Planning and Coordination (5 items,  $\alpha$  = .75), Curriculum Integration (5 items,  $\alpha$  = .89), Student Needs (8 items,  $\alpha$  = .86), Parental Involvement (4 items,  $\alpha$  = .80), and Contact with Resource Staff (5 items,  $\alpha$  = .70). With the exception of the flawed  $\chi^2$  statistic, the fit statistics of this model were excellent: NNFI = .96; CFI = .97; RMSEA = .080; standardized RMR = .059; and  $\chi^2$  (314, N=1,194) = 2,457.

Given that these five factors exhibited fairly strong correlations with each other (correlations ranged from .50 to .92), a final model was tested in which a single, higher-order factor was used to model the associations of the five lower-order factors, which in turn accounted for the relationships among the observed indicators. The fit of this model is nearly identical to that of the 5-factor model (NNFI = .96; CFI = .96; RMSEA = .085; standardized RMR = .064, and  $\chi^2$  [319, N=1,194] = 2,654), and thus we adopted this final and more parsimonious model as the best fitting model for team practices. The lower-order standardized loadings, standard error estimates, and  $R^2$  for each indicator are presented in the separate factors columns of Table 2. The standardized loadings of lower-order factors on the higher-order factor, along with the standard error estimates and  $R^2$  values are also in the separate factors columns of Table 2.

### *Classroom Practices*

#### *Exploratory Factor Analysis*

Based on the distribution of the scree plot, nine factors for the 56 classroom practices items were extracted using principle axis factoring and direct oblimin rotation with Kaiser normalization. These nine factors accounted for 53.3 percent of the variance. Examination of the pattern matrix (Table 3) suggested that the factors represented critical thinking activities in small groups (11 items,  $\alpha = .88$ ), integration activities (6 items,  $\alpha = .83$ ), authentic instruction and assessment (5 items,  $\alpha = .77$ ), literacy (9 items,  $\alpha = .84$ ), math skills (4 items,  $\alpha = .97$ ), computer usage (5 items,  $\alpha = .79$ ), community based learning (4 items,  $\alpha = .83$ ), citizenship and social competence (6 items,  $\alpha = .88$ ), and working in heterogeneous ability groups (6 items,  $\alpha = .79$ ).

*Confirmatory factor analysis*

We began confirmatory factor analysis (CFA) on the classroom practice variables by fitting a one factor model to 56 indicators with 981 teachers, and this model demonstrated fairly poor fit: NNFI = .85; CFI = .85; RMSEA = .13; standardized RMR = .10; and  $\chi^2(1,484, N=981) = 19,116$ . Our second model for classroom practices implemented a nine factor model, as suggested by the EFA reported above, with much better fit: NNFI = .96; CFI = .96; RMSEA = .063; standardized RMR = .063; and  $\chi^2(1,448, N=981) = 5,981$ . Although this nine factor model demonstrated excellent fit, we fit an additional model postulating a single, higher-order factor to account for the substantial correlations among the nine lower-order factors (correlations ranged from -.02 to .75), and this model also demonstrated excellent fit: NNFI = .96; CFI = .96; RMSEA = .066; standardized RMR = .072; and  $\chi^2(1,475, N=981) = 6,333$ . Because the fit of the higher-order CFA was nearly identical to that of the 9-factor CFA, we adopted this final and more parsimonious model as the best model for classroom practices. The lower-order standardized loadings, standard error estimates, and  $R^2$  for each indicator are presented in the separate factors columns of Table 2. The standardized loadings of lower-order factors on the higher-order factor, along with the standard error estimates and  $R^2$  values are in the separate factors columns of Table 2.

*Confirmatory Factor Analysis of Interdisciplinary Team  
and Classroom Practices Combined*

The constructs of team practices and classroom practices are conceptually related, and previous research has found them to be highly correlated (Flowers et al., 2000, 2003; Mertens & Flowers, 2003). Thus, we fit a final model to represent the relationship between these constructs

as the correlation between two higher-order factors, integrating the higher-order CFA model for team practices with the higher-order CFA model for classroom practices. In this model, the 27 team practice items load on one of the five lower-order team practices factors, which in turn load on the higher-order Team Practices factor; similarly, the 56 classroom practices items load on one of the nine lower-order classroom practices factors, which in turn load on the higher-order Classroom Practices factor. This model demonstrated excellent fit (NNFI = .97; CFI = .97; RMSEA = .056; standardized RMR = .068; and  $\chi^2[3,305, N=864] = 10,351$ ; and even the ratio of  $\chi^2$  to its df is a quite favorable 3.1. The intercorrelations of the lower-order and higher-order factors are presented in Table 4. Of particular note, the correlation between the Team Practices and Classroom Practices higher-order factors was estimated to be .69 ( $SE = .022$ ), suggesting a very strong relationship between these two constructs. The lower-order standardized loadings, standard error estimates, and  $R^2$  for each indicator are presented in the combined factors columns of Table 2. The standardized loadings of lower-order factors on the higher-order factor, along with the standard error estimates and  $R^2$  values are also in the combined factors columns of Table 2.

## Discussion

The educational importance of this study is in establishing reliable and valid psychometric measures of teachers' reports of interdisciplinary team practices and classroom instructional practices, two of the critical key components of middle-grades restructuring. Not only did we confirm that the School Improvement Self Study measures classroom practices and teaming practices reliably, but we also established the factor validity of these measures. This study, therefore, paves the way for more sophisticated models of teaming in the middle grades.

While it is common for research studies to proceed without the benefit of sound psychometric instruments in the early stages of exploring a new area of inquiry, it is perhaps disturbing when research on the middle grades concept has advanced to its current state without such a systemic development of sound instrumentation and a thorough examination of its psychometric properties; fortunately, this study remedies this gap within the extant research.

Similarly, prior research in examining the relationships between two or more components of the middle school concept has been minimal. Not only did we establish a link between the concepts of classroom practices and teaming practices at high levels of abstraction, we did so with a sophisticated model that utilized 14 lower-order factors to explain the associations of 83 observed measures, while simultaneously accounting for measurement error. This analysis, therefore, goes quite beyond reporting a simple Pearson-product-moment correlation of rough and untested measures.

### *Limitations*

Although quite sophisticated, this study is not without limitations. Our approach to reliability utilized the consistency among a set of items thought to measure the same construct rather than examining the consistency of measures over time. Similarly, our approach to validity centered on confirming the factor structure of our measures and did not include criterion-based validity. Ironically, it is the impressive sample size (generally one of the stronger assets of the study) that made these alternatives impractical.

*Future Research*

This study is the first step in examining the interactions of multiple components of middle-grades restructuring. It provides empirical research to support the validity of these measures and enables continued development and testing of a structural equation model of middle-grades school improvement and restructuring. Not only are we planning on using the measurement structure we developed and validated in this paper as the central constructs in a comprehensive model for the middle grades approach, but we also look forward to cross-validating our findings in the model-testing sample we reserved for future analyses.

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Table 1

Exploratory Factor Analysis: Pattern Matrix of Interdisciplinary Team Practices

| Item                | Factor loadings <sup>1</sup> |     |
|---------------------|------------------------------|-----|
|                     | 1                            | 2   |
| ta11                | .90                          |     |
| ta35                | .87                          |     |
| ta10                | .87                          |     |
| ta08                | .87                          |     |
| ta34                | .77                          |     |
| ta05                | .72                          |     |
| ta07                | .67                          |     |
| ta04                | .57                          |     |
| ta38                | .56                          |     |
| ta02                | .55                          |     |
| ta37                | .52                          |     |
| ta17                | .48                          | .24 |
| ta12                | .46                          | .24 |
| ta36                | .42                          | .29 |
| ta14                | .41                          |     |
| ta13                | .37                          | .22 |
| ta21                | .29                          |     |
| ta29                |                              | .83 |
| ta30                |                              | .78 |
| ta23                |                              | .75 |
| ta28                |                              | .65 |
| ta24                | .24                          | .52 |
| ta22                | .29                          | .45 |
| ta26                | .33                          | .42 |
| ta20                | .23                          | .41 |
| ta15                | .24                          | .37 |
| ta19                | .23                          | .33 |
| Factor correlations |                              |     |
|                     | Factor 1                     | .60 |
|                     | Factor 2                     | —   |

1 Factor loadings below .20 in absolute value have been suppressed from the table.

Table 2

Interdisciplinary Team and Classroom Practices: Standardized Factor Loadings, Standard Error Estimates, and Squared Multiple Correlations for Lower-Order and Higher-Order Factors

| Factor / Items   | Higher-Order Factors Modeled Separately |                          |                | Higher-Order Factors Modeled Together |                          |                |
|--|---|--------------------------|----------------|---------------------------------------|--------------------------|----------------|
|  | Standardized Loading ( $\lambda$ )      | Estimated Standard Error | R <sup>2</sup> | Standardized Loading ( $\lambda$ )    | Estimated Standard Error | R <sup>2</sup> |
| <b>INTERDISCIPLINARY TEAM PRACTICES</b>  |   |                          |                |                                       |                          |                |
| <b>Planning and Coordination<sup>1</sup></b>   | <b>.950</b>                             | <b>.037</b>              | <b>.902</b>    | <b>.963</b>                           | <b>.044</b>              | <b>.927</b>    |
| ta04 Plans special team projects and activities  | .714                                    | N/A <sup>2</sup>         | .509           | .697                                  | N/A <sup>2</sup>         | .486           |
| ta02 Sets goals and objectives related to student learning                                       | .663                                    | .062                     | .440           | .665                                  | .073                     | .442           |
| ta05 Spends time developing community/service learning opportunities and activities for students | .665                                    | .048                     | .442           | .660                                  | .058                     | .436           |
| ta37 Integrates technology throughout the curriculum   | .636                                    | .059                     | .404           | .642                                  | .070                     | .413           |
| ta14 Uses block or flexible scheduling to achieve instructional goals                            | .503                                    | .074                     | .253           | .511                                  | .087                     | .261           |
| <b>Curriculum Integration<sup>1</sup></b>  | <b>.837</b>                             | <b>.028</b>              | <b>.701</b>    | <b>.845</b>                           | <b>.033</b>              | <b>.714</b>    |
| ta11 Coordinates and integrates curricula across subject areas                                   | .887                                    | N/A <sup>2</sup>         | .786           | .883                                  | N/A <sup>2</sup>         | .780           |
| ta08 Teaches interdisciplinary units   | .831                                    | .035                     | .691           | .831                                  | .042                     | .691           |
| ta10 Evaluates curriculum in more than on subject area   | .798                                    | .040                     | .637           | .790                                  | .049                     | .624           |
| ta35 Integrates student assignments and assessments across subjects                              | .844                                    | .038                     | .712           | .850                                  | .044                     | .723           |
| ta07 Works together in the presentation of lessons   | .643                                    | .049                     | .414           | .629                                  | .060                     | .395           |
| <b>Coordination of Assignments and Assessments<sup>1</sup></b>                                   | <b>.995</b>                             | <b>.040</b>              | <b>.991</b>    | <b>.994</b>                           | <b>.048</b>              | <b>.989</b>    |
| ta17 Monitors and coordinates student tests across subjects                                      | .669                                    | N/A <sup>2</sup>         | .447           | .647                                  | N/A <sup>2</sup>         | .418           |
| ta34 Work together to develop and use consistent assessment standards across subjects            | .746                                    | .063                     | .556           | .750                                  | .077                     | .563           |

| Factor / Items  | Higher-Order Factors Modeled Separately   |                          |                  | Higher-Order Factors Modeled Together |                          |                  |             |
|---|---|--------------------------|------------------|---------------------------------------|--------------------------|------------------|-------------|
|   | Standardized Loading ( $\lambda$ )  | Estimated Standard Error | R <sup>2</sup>   | Standardized Loading ( $\lambda$ )    | Estimated Standard Error | R <sup>2</sup>   |             |
| ta24  | Holds conferences with students to recognize their accomplishments                                  | .657                     | .057             | .431                                  | .658                     | .068             | .433        |
| ta12  | Monitors and coordinates student homework across subjects   | .651                     | .073             | .424                                  | .630                     | .088             | .397        |
| ta38  | Work together to develop a personal progress plan for each student                                  | .668                     | .060             | .446                                  | .680                     | .074             | .463        |
| ta36  | Review/provide feedback on each other's assessments of student performance                          | .652                     | .067             | .425                                  | .640                     | .082             | .410        |
| ta26  | Identifies student learning styles in an effort to match instruction to student strengths and needs | .674                     | .065             | .454                                  | .668                     | .079             | .446        |
| ta23  | Meets with students as a team to address problems   | .615                     | .054             | .378                                  | .624                     | .065             | .389        |
| <b>Parent Contact<sup>1</sup></b>                           |   | <b>.736</b>              | <b>.032</b>      | <b>.542</b>                           | <b>.728</b>              | <b>.038</b>      | <b>.531</b> |
| ta29  | Discusses problems of specific students and arranges help   | .809                     | N/A <sup>2</sup> | .654                                  | .807                     | N/A <sup>2</sup> | .652        |
| ta30  | Meets with individual parents to solve problems, provide assistance                                 | .779                     | .040             | .606                                  | .783                     | .048             | .614        |
| ta28  | Informs each parent about the progress of his/her child   | .643                     | .036             | .414                                  | .627                     | .043             | .393        |
| ta22  | Plans and implements strategies to increase parent involvement                                      | .634                     | .046             | .402                                  | .623                     | .054             | .388        |
| <b>Contact with Other School Resource Staff<sup>1</sup></b> |   | <b>.818</b>              | <b>.038</b>      | <b>.669</b>                           | <b>.807</b>              | <b>.044</b>      | <b>.652</b> |
| ta20  | Coordinates efforts with guidance staff   | .703                     | N/A <sup>2</sup> | .494                                  | .701                     | N/A <sup>2</sup> | .491        |
| ta19  | Coordinates efforts with Special Education, Chapter 1, Bilingual Education, Music, etc.             | .600                     | .071             | .360                                  | .575                     | .084             | .331        |
| ta13  | Meets with staff from the library or learning media center  | .590                     | .059             | .348                                  | .603                     | .070             | .363        |
| ta15  | Meets with building administrator   | .584                     | .050             | .341                                  | .573                     | .060             | .329        |

| Factor / Items   |   | Higher-Order Factors Modeled Separately |                          |                | Higher-Order Factors Modeled Together |                          |                |
|--|---|---|--------------------------|----------------|---------------------------------------|--------------------------|----------------|
|  |   | Standardized Loading ( $\lambda$ )      | Estimated Standard Error | R <sup>2</sup> | Standardized Loading ( $\lambda$ )    | Estimated Standard Error | R <sup>2</sup> |
| ta21   | Coordinates efforts with school nurse/health coordinator  | .450                                    | .048                     | .202           | .473                                  | .058                     | .224           |
| <b>CLASSROOM PRACTICES</b>                               |   |   |                          |                |                                       |                          |                |
| <b>Small Group, Critical Thinking Skills<sup>1</sup></b> |   | <b>.813</b>                             | <b>.038</b>              | <b>.662</b>    | <b>.825</b>                           | <b>.040</b>              | <b>.680</b>    |
| cr26   | Students engage in group problem solving, negotiation and consensus development   | .744                                    | N/A <sup>2</sup>         | .554           | .742                                  | N/A <sup>2</sup>         | .551           |
| cr22   | Students participate in cooperative learning  | .680                                    | .053                     | .462           | .688                                  | .057                     | .474           |
| cr16   | Students participate in small group discussions   | .690                                    | .052                     | .476           | .694                                  | .056                     | .482           |
| cr80   | Students are asked to use strategies for self-questioning and summarizing   | .699                                    | .058                     | .489           | .688                                  | .063                     | .473           |
| cr21   | Students provide comments and feedback on each other's work   | .617                                    | .060                     | .381           | .621                                  | .065                     | .385           |
| cr77   | Students are asked to orally explain their answers to assignments   | .533                                    | .049                     | .284           | .536                                  | .053                     | .287           |
| cr29   | Students work on group projects   | .572                                    | .050                     | .328           | .578                                  | .053                     | .334           |
| cr78   | Students are asked to use charts, graphs, and diagrams as part of assignments   | .543                                    | .054                     | .294           | .528                                  | .058                     | .279           |
| cr28   | Students participate in peer tutoring   | .668                                    | .061                     | .446           | .674                                  | .065                     | .455           |
| cr112  | Students engage in "real world" learning activities (e.g., write a newspaper article, make a video) as part of class work | .559                                    | .054                     | .313           | .567                                  | .057                     | .321           |
| cr68   | Students are taught problem solving/decision making skills  | .645                                    | .056                     | .416           | .649                                  | .061                     | .421           |
| <b>Interdisciplinary Integration<sup>1</sup></b>         |   | <b>.662</b>                             | <b>.034</b>              | <b>.439</b>    | <b>.703</b>                           | <b>.036</b>              | <b>.494</b>    |
| cr07   | Teachers from other subject areas help to plan and carry out special class projects or activities                         | .850                                    | N/A <sup>2</sup>         | .722           | .846                                  | N/A <sup>2</sup>         | .716           |

| Factor / Items  | Higher-Order Factors Modeled Separately  |                          |                  | Higher-Order Factors Modeled Together |                          |                  |             |
|---|--|--------------------------|------------------|---------------------------------------|--------------------------|------------------|-------------|
|   | Standardized Loading ( $\lambda$ )   | Estimated Standard Error | R <sup>2</sup>   | Standardized Loading ( $\lambda$ )    | Estimated Standard Error | R <sup>2</sup>   |             |
| cr02  | Teachers from other subject areas help to plan and carry out instructional units                               | .821                     | .041             | .675                                  | .821                     | .043             | .675        |
| cr06  | Classroom curricula are integrated with topics that students are studying with teachers in other subject areas | .820                     | .040             | .673                                  | .815                     | .043             | .664        |
| cr04  | The class schedule (length of period or number of days met) is changed for instructional purposes              | .536                     | .049             | .287                                  | .543                     | .052             | .295        |
| cr01  | Interdisciplinary teaching materials are used  | .628                     | .052             | .394                                  | .629                     | .056             | .396        |
| cr08  | Use of the media center is integrated into lesson plans  | .536                     | .042             | .287                                  | .553                     | .044             | .306        |
| <b>Authentic Instruction and Assessment<sup>1</sup></b> |  | <b>.905</b>              | <b>.046</b>      | <b>.819</b>                           | <b>.882</b>              | <b>.047</b>      | <b>.777</b> |
| cr63  | Portfolios of a student's work are used as an indicator of student success                                     | .642                     | N/A <sup>2</sup> | .412                                  | .664                     | N/A <sup>2</sup> | .440        |
| cr96  | Exhibitions of students' work are used as part of instruction and assessment                                   | .698                     | .060             | .488                                  | .700                     | .062             | .490        |
| cr95  | Students work on development of materials/projects for portfolios  | .584                     | .069             | .341                                  | .592                     | .072             | .350        |
| cr98  | Students are given opportunities to revise assignments based on assessment feedback                            | .613                     | .068             | .376                                  | .626                     | .071             | .392        |
| cr49  | Alternative/authentic assessments are employed to evaluate student learning                                    | .661                     | .065             | .437                                  | .666                     | .068             | .443        |
| <b>Literacy Skills<sup>1</sup></b>                      |  | <b>.775</b>              | <b>.035</b>      | <b>.601</b>                           | <b>.767</b>              | <b>.037</b>      | <b>.588</b> |
| cr87  | Students work on and receive instruction in writing skills   | .813                     | N/A <sup>2</sup> | .662                                  | .821                     | N/A <sup>2</sup> | .674        |
| cr86  | Students work on and receive instruction in reading skills   | .766                     | .065             | .587                                  | .775                     | .069             | .600        |
| cr19  | Students write and keep journals   | .491                     | .075             | .241                                  | .491                     | .080             | .241        |
| cr13  | Students revise their reports and papers   | .601                     | .053             | .362                                  | .609                     | .056             | .371        |

| Factor / Items                         | Higher-Order Factors Modeled Separately   |                          |                  | Higher-Order Factors Modeled Together |                          |                  |             |
|--|---|--------------------------|------------------|---------------------------------------|--------------------------|------------------|-------------|
|  | Standardized Loading ( $\lambda$ )  | Estimated Standard Error | R <sup>2</sup>   | Standardized Loading ( $\lambda$ )    | Estimated Standard Error | R <sup>2</sup>   |             |
| cr23                                   | Students write essay reports and papers   | .623                     | .049             | .389                                  | .618                     | .053             | .382        |
| cr92                                   | Students receive assignments to read materials other than textbooks   | .649                     | .058             | .421                                  | .634                     | .062             | .402        |
| cr79                                   | Students engage in “pairs” reading and writing  | .606                     | .058             | .367                                  | .597                     | .062             | .356        |
| cr53                                   | Students take essay tests   | .506                     | .044             | .256                                  | .504                     | .046             | .254        |
| cr12                                   | Students read and discuss newspaper articles  | .487                     | .047             | .238                                  | .486                     | .050             | .237        |
| <b>Mathematical Skills<sup>1</sup></b> |   | <b>.273</b>              | <b>.034</b>      | <b>.074</b>                           | <b>.290</b>              | <b>.035</b>      | <b>.084</b> |
| cr106                                  | Mathematical concepts are taught using real world examples  | .987                     | N/A <sup>2</sup> | .974                                  | .988                     | N/A <sup>2</sup> | .976        |
| cr76                                   | Mathematical concepts and mathematical reasoning are integrated into lessons  | .967                     | .023             | .936                                  | .971                     | .023             | .943        |
| cr105                                  | Mathematics are taught using word problems  | .968                     | .023             | .937                                  | .974                     | .023             | .948        |
| cr91                                   | Students work on and receive instruction in mathematical reasoning and mathematical concepts                            | .897                     | .036             | .804                                  | .903                     | .038             | .815        |
| <b>Computer Usage<sup>1</sup></b>      |   | <b>.520</b>              | <b>.036</b>      | <b>.270</b>                           | <b>.534</b>              | <b>.038</b>      | <b>.285</b> |
| cr103                                  | Students type their papers or assignments on a computer   | .826                     | N/A <sup>2</sup> | .683                                  | .830                     | N/A <sup>2</sup> | .688        |
| cr102                                  | Students are given assignments that require them to look up information using a computer (e.g., world wide web, CD-ROM) | .868                     | .039             | .754                                  | .862                     | .041             | .744        |
| cr104                                  | Students complete their homework using spreadsheet programs, graphics programs, etc. on a computer                      | .600                     | .032             | .361                                  | .616                     | .034             | .379        |
| cr113                                  | Computers are integrated into lesson plans  | .690                     | .047             | .476                                  | .689                     | .050             | .474        |
| cr101                                  | Students communicate with me and/or other students using e-mail or an electronic mail system                            | .386                     | .047             | .149                                  | .408                     | .050             | .167        |

| Factor / Items  | Higher-Order Factors Modeled Separately |                          |                | Higher-Order Factors Modeled Together |                          |                |
|---|---|--------------------------|----------------|---------------------------------------|--------------------------|----------------|
|   | Standardized Loading ( $\lambda$ )      | Estimated Standard Error | R <sup>2</sup> | Standardized Loading ( $\lambda$ )    | Estimated Standard Error | R <sup>2</sup> |
| <b>Community-Based Learning<sup>1</sup></b>   | <b>.628</b>                             | <b>.035</b>              | <b>.394</b>    | <b>.633</b>                           | <b>.036</b>              | <b>.400</b>    |
| cr45 Assignments are designed to help students learn about resources in the community                                     | .846                                    | N/A <sup>2</sup>         | .716           | .864                                  | N/A <sup>2</sup>         | .746           |
| cr43 Projects are designed to help students learn about issues in the community   | .835                                    | .030                     | .697           | .840                                  | .032                     | .705           |
| cr44 Opportunities are provided for experiences in the community to expose students to different cultures and conditions  | .748                                    | .031                     | .560           | .749                                  | .033                     | .562           |
| cr41 People from the community are brought in to speak to the class about different topics                                | .589                                    | .024                     | .347           | .598                                  | .025                     | .358           |
| <b>Citizenship and Social Responsibility<sup>1</sup></b>  | <b>.729</b>                             | <b>.034</b>              | <b>.532</b>    | <b>.731</b>                           | <b>.036</b>              | <b>.534</b>    |
| cr74 A focus on personal growth and development (self-esteem and self knowledge) is emphasized                            | .834                                    | N/A <sup>2</sup>         | .695           | .838                                  | N/A <sup>2</sup>         | .702           |
| cr75 Social skill development is emphasized   | .795                                    | .054                     | .632           | .799                                  | .058                     | .638           |
| cr73 Emphasis on peer resistance/assertiveness is stressed  | .798                                    | .054                     | .637           | .795                                  | .057                     | .631           |
| cr69 Coping skills (e.g., stress management) development is emphasized  | .762                                    | .056                     | .581           | .759                                  | .059                     | .577           |
| cr70 Citizenship development (service to school and community) is emphasized  | .686                                    | .059                     | .470           | .699                                  | .062                     | .489           |
| cr71 Issues related to cultural diversity are discussed   | .660                                    | .053                     | .435           | .657                                  | .056                     | .431           |
| <b>Heterogeneous Ability Grouping<sup>1</sup></b>   | <b>.773</b>                             | <b>.042</b>              | <b>.598</b>    | <b>.777</b>                           | <b>.045</b>              | <b>.603</b>    |
| cr34 Strategies to facilitate learning at heterogeneous ability levels are utilized (in addition to cooperative learning) | .677                                    | N/A <sup>2</sup>         | .458           | .674                                  | N/A <sup>2</sup>         | .454           |
| cr33 Students are provided material at different grade levels   | .597                                    | .076                     | .356           | .593                                  | .081                     | .352           |
| cr39 Additional instruction/materials are provided to students who are ready to move on in a subject                      | .788                                    | .073                     | .621           | .793                                  | .079                     | .629           |

| Factor / Items |  | Higher-Order Factors Modeled Separately |                          |                | Higher-Order Factors Modeled Together |                          |                |
|----------------|--|---|--------------------------|----------------|---------------------------------------|--------------------------|----------------|
|                |  | Standardized Loading ( $\lambda$ )      | Estimated Standard Error | R <sup>2</sup> | Standardized Loading ( $\lambda$ )    | Estimated Standard Error | R <sup>2</sup> |
| cr38           | Additional instruction/materials are provided to students who fall behind in a subject | .766                                    | .069                     | .587           | .766                                  | .074                     | .586           |
| cr37           | Students work in heterogeneous ability groups to create individual and group projects  | .658                                    | .064                     | .433           | .663                                  | .068                     | .440           |
| cr111          | Students from different grade levels are taught in the same classroom                  | .295                                    | .077                     | .087           | .301                                  | .083                     | .091           |

| <b>Interdisciplinary Teaming Measures</b>    | Factor correlations <sup>3</sup> |     |     |     |     |
|--|----------------------------------|-----|-----|-----|-----|
|  | 1                                | 2   | 3   | 4   | 5   |
| 1. Planning and coordination                 | —                                | .80 | .94 | .70 | .78 |
| 2. Curriculum integration                    | .89                              | —   | .83 | .62 | .68 |
| 3. Coordination of assignments & assessments | .92                              | .82 | —   | .73 | .81 |
| 4. Parent contact                            | .64                              | .50 | .79 | —   | .60 |
| 5. Contact with other school resource staff  | .77                              | .64 | .82 | .68 | —   |

| <b>Classroom Practices Measures</b>      | Factor correlations <sup>3</sup> |     |     |      |     |     |     |     |     |
|--|----------------------------------|-----|-----|------|-----|-----|-----|-----|-----|
|  | 1                                | 2   | 3   | 4    | 5   | 6   | 7   | 8   | 9   |
| 1. Small group, critical thinking skills | —                                | .54 | .74 | .63  | .22 | .42 | .51 | .59 | .63 |
| 2. Interdisciplinary integration         | .53                              | —   | .60 | .51  | .18 | .34 | .42 | .48 | .51 |
| 3. Authentic instruction and assessment  | .72                              | .57 | —   | .70  | .25 | .47 | .57 | .66 | .70 |
| 4. Literacy skills                       | .61                              | .50 | .75 | —    | .21 | .40 | .49 | .56 | .60 |
| 5. Mathematical skills                   | .40                              | .21 | .22 | -.02 | —   | .14 | .17 | .20 | .21 |
| 6. Computer usage                        | .38                              | .43 | .47 | .46  | .05 | —   | .33 | .38 | .40 |
| 7. Community-based learning              | .43                              | .48 | .62 | .47  | .10 | .44 | —   | .46 | .49 |
| 8. Citizenship and social responsibility | .62                              | .44 | .63 | .60  | .29 | .31 | .50 | —   | .56 |
| 9. Heterogeneous ability grouping        | .68                              | .55 | .69 | .58  | .25 | .36 | .42 | .56 | —   |

1 These entries represent the loadings of lower-order factors on the higher-order factor. All other loadings represent loadings of items on lower-order factors.

2 The standard error estimates are not computed for items used as reference indicators to establish the scales of latent variables.

3 The correlations above the main diagonal were derived from loadings of these lower-order factors on the higher-order factor rather than through the estimation of association parameters in the model. The correlations below the main diagonal are parameter estimates from the non-higher-order confirmatory factor analysis.

Table 3  
Exploratory Factor Analysis: Pattern Matrix of Classroom Practices

| Item  | <u>Factor loadings<sup>1</sup></u>  |     |     |     |     |     |     |     |      |
|-------|---|-----|-----|-----|-----|-----|-----|-----|------|
|       | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9    |
| cr16  | Students participate in small group discussions   | .65 |     |     |     |     |     |     |      |
| cr22  | Students participate in cooperative learning  | .62 |     |     |     |     |     | .21 |      |
| cr26  | Students engage in group problem solving, negotiation and consensus development   | .59 |     |     |     |     |     |     |      |
| cr78  | Students are asked to use charts, graphs, and diagrams as part of assignments   | .45 |     |     |     |     |     |     |      |
| cr21  | Students provide comments and feedback on each other's work   | .45 |     |     |     | .26 |     |     |      |
| cr79  | Students engage in "pairs" reading and writing  | .44 |     |     |     | .28 |     |     |      |
| cr77  | Students are asked to orally explain their answers to assignments   | .43 |     |     |     |     |     |     |      |
| cr28  | Students participate in peer tutoring   | .42 | .20 |     |     |     |     |     |      |
| cr80  | Students are asked to use strategies for self-questioning and summarizing   | .42 |     |     | .28 |     |     |     |      |
| cr29  | Students work on group projects   | .39 |     |     |     |     |     |     | -.20 |
| cr112 | Students engage in "real world" learning activities (e.g., write a newspaper article, make a video) as part of class work | .23 |     |     |     |     | .20 |     |      |
| cr105 | Mathematics are taught using word problems  |     | .97 |     |     |     |     |     |      |
| cr106 | Mathematical concepts are taught using real world examples  |     | .97 |     |     |     |     |     |      |
| cr76  | Mathematical concepts and mathematical reasoning are integrated into lessons  |     | .96 |     |     |     |     |     |      |
| cr91  | Students work on and receive instruction in mathematical reasoning and mathematical concepts                              |     | .89 |     |     |     |     |     |      |
| cr102 | Students are given assignments that require them to look up information using a computer (e.g., world wide web, CD-ROM)   |     |     | .86 |     |     |     |     |      |

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| Item  | Factor loadings <sup>1</sup> |     |     |     |   |   |     |   |   |
|-------|------------------------------|-----|-----|-----|---|---|-----|---|---|
|       | 1                            | 2   | 3   | 4   | 5 | 6 | 7   | 8 | 9 |
| cr103 |                              |     | .82 |     |   |   |     |   |   |
| cr113 |                              |     | .66 |     |   |   |     |   |   |
| cr104 |                              |     | .60 |     |   |   |     |   |   |
| cr101 |                              |     | .37 |     |   |   |     |   |   |
| cr74  |                              |     |     | .86 |   |   |     |   |   |
| cr75  |                              |     |     | .74 |   |   |     |   |   |
| cr73  |                              |     |     | .69 |   |   |     |   |   |
| cr70  |                              |     |     | .67 |   |   |     |   |   |
| cr69  |                              |     |     | .66 |   |   |     |   |   |
| cr71  |                              |     |     | .51 |   |   | .22 |   |   |
| cr68  | .27                          | .34 |     | .34 |   |   |     |   |   |
| cr07  |                              |     |     |     |   |   |     |   |   |
| cr02  |                              |     |     |     |   |   |     |   |   |
| cr06  |                              |     |     |     |   |   |     |   |   |
| cr04  |                              |     |     |     |   |   |     |   |   |
| cr01  |                              |     |     |     |   |   |     |   |   |
| cr08  |                              |     | .29 |     |   |   |     |   |   |

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| Item  | Factor loadings <sup>1</sup> |   |   |   |      |     |     |   |      |
|-------|------------------------------|---|---|---|------|-----|-----|---|------|
|       | 1                            | 2 | 3 | 4 | 5    | 6   | 7   | 8 | 9    |
| plans |                              |   |   |   |      |     |     |   |      |
| cr87  |                              |   |   |   |      | .83 |     |   |      |
| cr86  |                              |   |   |   |      | .70 |     |   |      |
| cr13  |                              |   |   |   |      | .36 |     |   | -.23 |
| cr92  |                              |   |   |   |      | .34 |     |   |      |
| cr23  |                              |   |   |   |      | .32 |     |   | -.30 |
| cr19  | .21                          |   |   |   |      | .29 |     |   | -.22 |
| cr43  |                              |   |   |   |      |     | .77 |   |      |
| cr44  |                              |   |   |   |      |     | .76 |   |      |
| cr45  |                              |   |   |   |      |     | .76 |   |      |
| cr41  |                              |   |   |   |      |     | .55 |   |      |
| cr53  |                              |   |   |   |      | .26 | .32 |   |      |
| cr12  |                              |   |   |   |      | .22 | .27 |   |      |
| cr34  |                              |   |   |   |      |     |     |   | .69  |
| cr38  |                              |   |   |   |      |     |     |   | .65  |
| cr39  |                              |   |   |   |      |     |     |   | .59  |
| cr33  |                              |   |   |   |      |     |     |   | .58  |
| cr37  | .32                          |   |   |   | -.19 |     |     |   | .51  |
| cr111 |                              |   |   |   |      |     |     |   | .19  |

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| Item                | Factor loadings <sup>1</sup>   |      |      |      |      |      |      |      |      |      |
|---------------------|--|------|------|------|------|------|------|------|------|------|
|                     | 1  | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |      |
| cr63                | the same classroom<br>Portfolios of a student's work are used as an indicator of student success |      |      |      |      |      |      |      |      | -.70 |
| cr95                | Students work on development of materials/projects for portfolios                                |      |      |      |      |      |      |      |      | -.55 |
| cr98                | Students are given opportunities to revise assignments based on assessment feedback              |      | .20  |      |      |      |      | .21  |      | -.38 |
| cr96                | Exhibitions of students' work are used as part of instruction and assessment                     |      |      |      |      |      |      |      |      | -.34 |
| cr49                | Alternative/authentic assessments are employed to evaluate student learning                      |      |      |      | .22  |      |      | .20  |      | -.30 |
| Factor correlations |  |      |      |      |      |      |      |      |      |      |
|                     | Factor 1   | —    | .22  | .25  | .32  | -.31 | .20  | .15  | .32  | -.31 |
|                     | Factor 2   | .22  | —    | .01  | .29  | -.14 | -.08 | .03  | .17  | -.10 |
|                     | Factor 3   | .25  | .01  | —    | .21  | -.38 | .20  | .40  | .20  | -.30 |
|                     | Factor 4   | .32  | .29  | .21  | —    | -.31 | .34  | .37  | .42  | -.29 |
|                     | Factor 5   | -.31 | -.14 | -.38 | -.31 | —    | -.25 | -.42 | -.38 | .36  |
|                     | Factor 6   | .20  | -.08 | .20  | .34  | -.25 | —    | .22  | .27  | -.41 |
|                     | Factor 7   | .15  | .03  | .40  | .37  | -.42 | .22  | —    | .24  | -.44 |
|                     | Factor 8   | .32  | .17  | .20  | .42  | -.38 | .27  | .24  | —    | -.31 |
|                     | Factor 9   | -.31 | -.10 | -.30 | -.29 | .36  | -.41 | -.44 | -.31 | —    |

<sup>1</sup> Factor loadings below .20 in absolute value have been suppressed from the table.

Table 4. Intercorrelations for Lower-Order Factors on Lower-Order Factors and Higher-Order Factors of Interdisciplinary Team and Classroom Practices

| Measure                                     | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| 1 Planning & coordination                   | —    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |    |
| 2 Curriculum integration                    | 0.81 | —    |      |      |      |      |      |      |      |      |      |      |      |      |      |    |
| 3 Coordination of assignments & assessments | 0.96 | 0.84 | —    |      |      |      |      |      |      |      |      |      |      |      |      |    |
| 4 Parent contact                            | 0.70 | 0.62 | 0.72 | —    |      |      |      |      |      |      |      |      |      |      |      |    |
| 5 Contact with other school staff           | 0.78 | 0.68 | 0.80 | 0.59 | —    |      |      |      |      |      |      |      |      |      |      |    |
| 6 Small group, critical thinking skills     | 0.55 | 0.48 | 0.56 | 0.41 | 0.46 | —    |      |      |      |      |      |      |      |      |      |    |
| 7 Interdisciplinary integration             | 0.46 | 0.41 | 0.48 | 0.35 | 0.39 | 0.58 | —    |      |      |      |      |      |      |      |      |    |
| 8 Authentic instruction & assessment        | 0.58 | 0.51 | 0.60 | 0.44 | 0.49 | 0.73 | 0.62 | —    |      |      |      |      |      |      |      |    |
| 9 Literacy skills                           | 0.51 | 0.44 | 0.52 | 0.38 | 0.42 | 0.63 | 0.54 | 0.68 | —    |      |      |      |      |      |      |    |
| 10 Math skills                              | 0.19 | 0.17 | 0.20 | 0.15 | 0.16 | 0.24 | 0.20 | 0.26 | 0.22 | —    |      |      |      |      |      |    |
| 11 Computer usage                           | 0.35 | 0.31 | 0.36 | 0.27 | 0.30 | 0.44 | 0.38 | 0.47 | 0.41 | 0.16 | —    |      |      |      |      |    |
| 12 Community-based learning                 | 0.42 | 0.37 | 0.43 | 0.32 | 0.35 | 0.52 | 0.45 | 0.56 | 0.49 | 0.18 | 0.34 | —    |      |      |      |    |
| 13 Citizenship & social responsibility      | 0.48 | 0.42 | 0.50 | 0.37 | 0.40 | 0.60 | 0.51 | 0.64 | 0.56 | 0.21 | 0.39 | 0.46 | —    |      |      |    |
| 14 Heterogeneous grouping                   | 0.51 | 0.45 | 0.53 | 0.39 | 0.43 | 0.64 | 0.55 | 0.69 | 0.60 | 0.23 | 0.42 | 0.49 | 0.57 | —    |      |    |
| 15 Team practices                           | 0.96 | 0.85 | 0.99 | 0.73 | 0.81 | 0.57 | 0.48 | 0.60 | 0.53 | 0.20 | 0.37 | 0.43 | 0.50 | 0.53 | —    |    |
| 16 Classroom practices                      | 0.66 | 0.58 | 0.68 | 0.50 | 0.55 | 0.83 | 0.70 | 0.88 | 0.77 | 0.29 | 0.53 | 0.63 | 0.73 | 0.78 | 0.69 | —  |